

In the Claims

1. (Previously Presented)

A pass-through electrical connector assembly comprising:
a body of an electrically insulative and somewhat yieldable plastic or rubber material;
at least one through-hole formed in said body; and
an electrically conductive pin forced into said through-hole and retained in said body,
said pin having:

first and second ends each having a recess therein constructed to receive and
have permanently attached thereto a separate electrically conductive wire;

an intermediate solid portion between said recesses constructed to separate
said wires and provide a fluid-tight seal between said wires and said pin;

a tip adjacent said first end of said pin, said tip having at least one barb
constructed to engage said body when said pin is forced into said through-hole;

a head formed adjacent said second end of said pin, said head having a
shoulder constructed to engage said body when said pin is forced into said through-hole; and

a circumferentially continuous exterior surface between said ends press-fit
into said through-hole of said body with an interference fit with said body and forming a
fluid-tight seal between said pin and said body.

2. (Original)

A pass-through electrical connector assembly as defined in claim 1 wherein said
body is a housing constructed of plastic.

3. (Original)

A pass-through electrical connector assembly as defined in claim 1 wherein said body is a housing constructed of synthetic rubber.

4. (Currently Amended)

A pass-through electrical connector assembly as defined in claim 1 wherein said body is made of a low hydrocarbon permeation material.

5. (Original)

A pass-through electrical connector assembly as defined in claim 1 which also comprises a flange having a hole complementary to said body and said body is received in said hole in said flange and sealed to said flange.

6. (Original)

A pass-through electrical connector assembly as defined in claim 5 wherein said body comprises a snap latch constructed to retain said body in said flange.

7. (Original)

A pass-through electrical connector assembly as defined in claim 5 wherein said body comprises a retainer sealing said body to said flange.

8. (Currently Amended)

A pass-through electrical connector assembly comprising:
a body of an electrically insulative and somewhat yieldable plastic or rubber material;
at least one through-hole formed in said body; and
an electrically conductive pin forced into said through-hole and retained in said body,
said pin having:

first and second ends each having a recess therein constructed to receive and
have permanently attached thereto a separate electrically conductive wire;

an intermediate solid portion between said recesses constructed to separate
said wires and provide a fluid-tight seal between said wires and said pin;

a tip adjacent said first end of said pin, said tip having at least one barb
constructed to engage said body when said pin is forced into said through-hole;

a head formed adjacent said second end of said pin, said head having a
shoulder constructed to engage said body when said pin is forced into said through-hole; and

a circumferentially continuous exterior surface between said ends press-fit
into said through-hole of said body with an interference fit with said body and forming a
fluid-tight seal between said pin and said body;

~~a pass-through electrical connector assembly as defined in claim 1 wherein~~
said body has at least two through-holes formed in said body and adjacent through-holes are
axially offset relative to each other so that the shoulders of the pin received in adjacent
through-holes are axially offset relative to each other.

9. (Original)

A pass-through electrical connector assembly as defined in claim 1 which also comprises at least one elastomeric seal between said pin and said body.

10. (Previously Presented)

A pass-through electrical connector assembly as defined in claim 1 wherein said pin has a separate blind hole with a circumferentially continuous sidewall opening into each of said ends of said pin and constructed to receive a separate wire in each blind hole permanently attached therein.

11. (Previously Presented)

A pass-through electrical connector assembly as defined in claim 1 wherein said pin has a blind hole with a circumferentially continuous sidewall opening into one of said first and second ends and constructed to receive a wire in the blind hole permanently attached therein and the other of said ends is solid.

12. (Previously Presented)

A pass-through electrical connector assembly as defined in claim 22 wherein said first and second ends of said pin are solid.

13. (Previously Presented)

A pass-through electrical connector assembly as defined in claim 12 wherein at least one end of said pin is adapted to receive thereon an engaging terminal for a wire.

14. (Previously Presented)

A pass-through electrical connector assembly as defined in claim 12 wherein said first and second ends of said pin are each adapted to receive thereon an engaging terminal for a wire.

15. (Original)

A pass-through electrical connector assembly as defined in claim 1 wherein said circumferential surface is cylindrical.

16. (Original)

A pass-through electrical connector assembly as defined in claim 1 wherein said circumferential surface is tapered.

17. (Currently Amended)

A pass-through electrical connector assembly comprising:
a body of an electrically insulative and somewhat yieldable plastic or rubber material;
at least one through-hole formed in said body; and
an electrically conductive pin forced into said through-hole and retained in said body,
said pin having:
first and second ends each having a recess therein constructed to receive and
have permanently attached thereto a separate electrically conductive wire;
an intermediate solid portion between said recesses constructed to separate

said wires and provide a fluid-tight seal between said wires and said pin;

a tip adjacent said first end of said pin, said tip having at least one barb constructed to engage said body when said pin is forced into said through-hole;

a head formed adjacent said second end of said pin, said head having a shoulder constructed to engage said body when said pin is forced into said through-hole; and

a circumferentially continuous exterior surface between said ends press-fit into said through-hole of said body with an interference fit with said body and forming a fluid-tight seal between said pin and said body;

~~a pass-through electrical connector assembly as defined in claim 1 wherein~~
said tip has a frusto conical portion at said first end to facilitate insertion of said pin into said through-hole.

18. (Currently Amended)

A pass-through electrical connector assembly comprising:

a body of an electrically insulative and somewhat yieldable plastic or rubber material;

at least one through-hole formed in said body; and

an electrically conductive pin forced into said through-hole and retained in said body,

said pin having:

first and second ends each having a recess therein constructed to receive and have permanently attached thereto a separate electrically conductive wire;

an intermediate solid portion between said recesses constructed to separate said wires and provide a fluid-tight seal between said wires and said pin;

a tip adjacent said first end of said pin, said tip having at least one barb

constructed to engage said body when said pin is forced into said through-hole;

a head formed adjacent said second end of said pin, said head having a shoulder constructed to engage said body when said pin is forced into said through-hole; and

a circumferentially continuous exterior surface between said ends press-fit into said through-hole of said body with an interference fit with said body and forming a fluid-tight seal between said pin and said body;

~~a pass-through electrical connector assembly as defined in claim 1~~ wherein said tip is diametrically smaller than said circumferentially continuous surface of said pin.

19. (Original)

A pass-through electrical connector assembly as defined in claim 1 wherein the maximum diameter of said barb is larger than the maximum diameter of said circumferentially continuous surface of said pin.

20. (Original)

A pass-through electrical connector assembly as defined in claim 1 wherein said shoulder of said head is diametrically larger than said circumferentially continuous surface of said pin.

21. (Original)

A pass-through electrical connector assembly as defined in claim 1 wherein said circumferentially continuous surface of said pin is diametrically larger than said through-hole prior to said pin being forced into said through-hole.

22. (Previously Presented)

A pass-through electrical connector assembly comprising:

a body of an electrically non-conductive and somewhat yieldable material;

at least two through-holes each formed in said body; and

a separate pin of an electrically conductive material forced into each one of said through-holes and retained in said body, each said pin having:

a shank with opposed ends each constructed to receive and have permanently attached thereto a separate wire;

a solid portion between said wires received on said opposed ends and providing a fluid-tight seal between said wires and said pin;

a tip formed adjacent one end of said pin, said tip having at least one barb constructed to engage said body when said pin is forced into said through-hole;

a head formed adjacent the other end of said pin, said head having a shoulder constructed to engage said body when said pin is forced into said through-hole; and

an intermediate portion of said shank having a circumferentially continuous exterior surface press-fit within said through-hole of said body with an interference fit with said body thereby forming a fluid-tight seal between said pin and said body.

23. (Original)

A pass-through electrical connector assembly as defined in claim 22 wherein said body is made of a plastic material.

24. (Original)

A pass-through electrical connector assembly as defined in claim 22 wherein said body is received in a complementary hole in a flange and said body has a snap latch constructed to engage said flange.

25. (Original)

A pass-through electrical connector assembly as defined in claim 22 wherein said body is made of a low permeation material.

26. (Original)

A pass-through electrical connector assembly as defined in claim 22 wherein said tip is diametrically smaller than said intermediate portion of said shank.

27. (Original)

A pass-through electrical connector assembly as defined in claim 22 wherein the maximum diameter of said barb is larger than the maximum diameter of said circumferential surface of said intermediate portion of said shank.

28. (Original)

A pass-through electrical connector assembly as defined in claim 22 wherein said shoulder of said head is diametrically larger than said intermediate portion of said shank.

29. (Original)

A pass-through electrical connector assembly as defined in claim 22 wherein said maximum diameter of said intermediate portion is larger than said minimum diameter of said through-hole.

30. (Previously Presented)

A method of forming a pass-through electrical connector assembly comprising:

providing a body of an electrically non-conductive and somewhat yieldable plastic or rubber material having at least one through-hole therein,

providing a an electrically conductive pin having a shank with opposed ends and at least one of the ends constructed to receive and have permanently attached thereto an electrically conductive wire,

 a tip having a barb adjacent one end,

 a head having a shoulder adjacent the other end, and

 an intermediate portion having a circumferentially continuous exterior surface with a maximum diameter larger than the minimum diameter of the through-hole of the body,

inserting the tip of the pin into the through-hole and forcing the barb into and through the through-hole and the intermediate portion into the through-hole to provide an interference fit of at least the circumferentially continuous exterior surface in the body providing a fluid-tight seal between the pin and the body.

31. (Previously Presented)

The method of claim 30 which also comprises providing a blind hole with a circumferentially continuous sidewall opening into the pin, inserting an electrically conductive wire into the blind hole and permanently attaching at least a portion of the wire in the blind hole to the pin.

32. (Original)

The method of claim 31 which also comprises soldering at least a portion of the wire in the blind hole to the pin.

33. (Previously Presented)

The method of claim 31 which also comprises crimping the pin to firmly engage and permanently retain at least a portion of the wire in the blind hole.

34. (Previously Presented)

The method of claim 30 which comprises prior to inserting the pin into the through-hole, the steps of providing a blind hole in the pin which opens onto one end of the pin and has a circumferentially continuous sidewall, inserting one end of an electrically conductive wire into the blind hole, and permanently attaching at least a portion of the wire in the blind hole to the pin.

35. (Previously Presented)

The method of claim 30 which also comprises prior to inserting the pin into the through-hole in the body, the steps of providing in the pin a first blind hole opening onto one end of the pin and having a circumferentially continuous sidewall, and a second blind hole opening onto the other end of the pin and having a circumferentially continuous sidewall, with the intermediate portion disposed between the blind holes, inserting one end of a first conductive wire into one of the blind holes, inserting one end of a separate second conductive wire into the other blind hole, permanently attaching at least a portion of the wire in each blind hole to the pin, and subsequently inserting one of the wires into the through-hole so that after the step of inserting the pin into the through-hole of the body is completed the first and second wires extend out of and beyond generally opposed ends of the body.

36. (New)

A pass-through electrical connector assembly as defined in claim 1 wherein the through-hole includes a shoulder and said barb defines a base that overlies and engages the shoulder and has a maximum diameter that is greater than the minimum diameter of the through hole.